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A CONTRIBUTION TO THE BIOLOGY OF HOUBARA: 1982-83 WINTERING POPULATION IN BALUCHISTAN¹

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(With a text-figure)

The Houbara Bustard (*Chlamydotis undulata macqueeni*) is very widely distributed in the valleys and semi-desert plains of Baluchistan, depending upon the distribution of the plants. They are winter visitors and stay in the area from October to February, each year, though some of the northern areas may harbour a reasonable population till early April. The bird is under severe hunting stress from the local hunters (approximately 1500 birds) and the visiting Arab falconers (claiming at least 2860 birds) in all the areas bearing a sizeable wintering population. A tentative population distribution map has been attempted to show the relative frequencies of the bird in different areas of the province. There are indications that some 50—100 pairs do breed in Western Baluchistan, but this activity does not seem to be a regular feature of the area.

INTRODUCTION

Our preliminary research on the biology and conservation of the Houbara Bustard (*Chlamydotis undulata macqueeni*) with special reference to its wintering population of Western Baluchistan, during 1981-1982, prompted us to continue our research activities on this elegant bird with the aim of providing sufficient research data upon which a scientific conserva-

tion strategy could be based, before it is completely lost from this part of the globe (Mian & Surahio 1983, Mian & Shaheena *in press*; Mian 1983). This paper therefore presents some further data regarding the distribution, population levels, and hunting stress regarding the population of the bird wintering in Baluchistan and adjoining areas during 1982-83.

METHODS AND MATERIALS

Regrettably, severe budgetary limitations prevented us from conducting an extensive tour of the area, as we had hoped, to

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collect first hand information, on this bird. However, to overcome this serious handicap a carefully drafted questionnaire was circulated to some of our past students residing in Panjgur (29.98° N and 64.10° E) and Sibi (29.56°N and 67.89°E), to the Sub-divisional Officer, Wildlife, of the Baluchistan Forest Department, who accompanied the visiting Arab falconers in Chagai (26.98°N and 64.70°E) and Kharan (28.58°N and 65.42°E) areas and to a well-reputed old hunter of Taunsa (30.30°N and 70.65°E). The questionnaire contained the appropriate questions regarding the preferred habitat, approximate density of the bird in favourable areas, preferred food, migration patterns and dates, hunting pressures in that locality and the chances of breeding in the area. The facsimile of the questionnaire is shown in appendix I. All were instructed to collect information through their own observations and through contacts with other reputed hunters and local people of the area. These informers were then further cross questioned by us personally in March 1983, so as to extract as much information as possible and to be able to evaluate the possibility of a bias, which might have crept into their observations.

Some 16 students, who had just returned from their long winter break (December 17, 1982 to February 28, 1983) from different areas of Baluchistan, were also interviewed the different questions of our basic questionnaire or anything they might have noticed concerning the biology and ecology of the Houbara in their respective areas. Surprisingly, the information collected through various independent sources bore a remarkable identity with one another. A few observations, which were contrary to the general consensus of views were eliminated from the final analysis, after giving due consideration to

the status of the source.

Sokal & Rohlf (1969) were followed for the statistical analysis of the data.

RESULTS AND DISCUSSION

Houbara Behaviour and Habitat Preference.

The majority of the information collected by different sources regarding the behaviour and habitat preference of the Houbara Bustard are in conformity with what we reported in our earlier study (Mian & Surahio 1983). The Houbara, in general is a very wary bird intolerant of human disturbance and hence prefers flat desolate desert plains having sandy or loose stony substratum with sparsely distributed bushes, so that its vision is not restricted. The bird inhabits the open, vast steppic desert plains avoiding the narrow valleys and mountain slopes. It is said to avoid the very extreme desert conditions in this region, where it shows a very sparse distribution, especially during certain years of better precipitation, though it is found in almost similar inhospitable conditions in other parts, i.e. Cholistan (Mirza 1971). The houbara also avoids the large human settlements, though the small scattered villages and nomadic shepherd camps as well as the grazing livestock, i.e. sheep, goat, cattle and camel have little influence over its distribution.

The Houbara is mainly diurnal in habit, though it is also active during moonlit nights. It rests during the hot part of the day in ditches or shallow dry courses of the hill torrents and on certain flat beds during dark night. The Houbara is generally regarded as omnivorous and hence may feed on almost everything available to it, including dried grasses, associated insects and even reptiles, but predominantly it is a herbivore and largely depends upon vegetable

matter such as leaves, shoots and seeds of the preferred plants. Some observers believe that it prefers moonlit nights for feeding activities, but it mainly feeds during the day in accordance with the available conditions. The presence of very large eyes in the bird lends some support to the contention that it is partly nocturnal in feeding activity.

Migration. The majority of the observations collected through our questionnaire regarding the migration of bustards confirm our previous report (Mian & Surahio 1983) that the wintering population of the Houbara migrates into Baluchistan through very diffused routes all along the north-western border of the province, and it disperses southwards and eastwards gradually in the various parts of Baluchistan. The size of the incoming groups is larger in the northern areas like Chagai plains, Dasht plains near Nushki, and the plains of Yakmuch (10-12 birds per group) as compared with the number observed further south in Panjgur and in Sibi (2-4 birds per group). The larger groups can also be observed in southern and eastern regions during the later part of the immigration season. The population passing through Taunsa also have a smaller size of the group compared with that observed in Chagai and Nushki. This may be because the population reaching Taunsa has travelled a longer route, and has consequently undergone considerable dispersion prior to reaching the area. The population of Taunsa, however, further migrates into deserts of Thal and Cholistan, of the Punjab. The observations collected by us also indicate that the wintering population of Sibi and deeper parts of Sind, mainly come through Baluchistan and hence confirm the findings of Surahio (1981, 1982).

The precise dates, when the bustards were first seen in the different areas could not be

recorded. However, the information conveyed to us from the different parts of the province and adjoining areas suggests that the birds are first noted in Baluchistan in late September or in the first week of October in the deeper parts, and they start migrating back to their summering grounds during late February and early March. However, a sizeable population of the bird is present in plains of Yakmuch, Chagai and Kharan till late March or early April. The duration of stay along their migratory routes and their various wintering grounds depends upon the relative abundance of food and suitable vegetation. It has also been frequently observed that the birds returning through an area on spring migration use the same routes as were adopted while entering an area in autumn.

Our questionnaire revealed consistent observations that the Houbara migrates on moonlit nights. It could not be ascertained as to whether this was a preferred habit or if this was an occasional preference. This also does not completely rule out the possibility that there is no migration during dark nights, because there can be few casual observations at that time and also the activities of the hunters (who might observe the bird) are generally limited during dark nights. This would suggest that a further detailed study is needed regarding this aspect of the Houbara biology. If these observations prove to be true, then the time of migration will also need to be adjusted to the lunar cycle and a variation is to be expected between years.

It was also interesting to note that an individual bird with a partially damaged tarsus was regularly observed visiting the same area of Sibi for four consecutive years. This information seems to be in conformity with similar reports on other non-related migratory birds including small passerines, which suggest a

faithful adherence to certain predefined routes and localities, during migration. Further colour banding studies on the Houbara would be particularly interesting to corroborate such observations.

Hunting. The observations conveyed to us by different informants revealed that the Houbara is hunted in the different areas by the local populace (using shot guns) for pleasure and also to obtain meat. The hunting is sometimes facilitated by the use of a jeep or by approaching the bird at a reasonable shooting distance through a herd of grazing sheep/goat/cattle/camel or by riding camel back or on a bullock cart. Netting of the live bird is also practised, on a limited scale, in all areas having a sizeable population of the Houbara. A triangular enclosure of nets is used in western Baluchistan, whereas in Taunsa and Sibi areas straight nets are used in which apparently the foot of the bird gets caught. The bustards are driven into the net with the help of a herd of camels or other livestock, bullock carts and jeeps.

A comprehensive report regarding the hunting activities of local hunters is not available. The reports from Taunsa suggest that some 300 birds were killed during the last winter. This is despite the fact that the Houbara is a partially protected species under the Punjab Wildlife Protection Ordinance under Schedule III. Various reports regarding the bags of the local hunters, when collected together lead us to calculate that a total of some 1500 birds were killed in western Baluchistan, Sibi and adjoining areas of Taunsa by such local *shikaris*. It is said that the hunting toll by the local hunters is on the increase due to a gradual sophistication of the hunting methods and hunting aids including motorised communication and the development of link roads. Further, the number of birds killed was relatively

higher during this winter (1982-83) due to a greater population of the Houbara present in all the areas, as a result of favourable rains the previous winter.

The major hunting stress undoubtedly is from the visiting falconers, coming from the Middle East and the Persian Gulf States. The available data suggest that a minimum of 1742 birds were killed by such visiting hunters over a period of 28 days, in Chagai District alone. In Kharan, two independent parties hunted at least 768 birds in 41 days. The report from Sibi and Taunsa indicated that between 250-350 birds were killed by the visiting Arab falconers. Thus, the cumulative bag data for all the visiting hunters throughout Baluchistan and adjoining areas suggest that some 2860 birds have been hunted during this winter. It seems relevant to mention that because of the secrecy being maintained by these visiting foreign dignitaries and the security measures being adopted in such areas very exact bag data are difficult to collect. In fact, informers consistently expressed the opinion that the actual numbers hunted were much more than reported.

There is unfortunately ample evidence of a progressive increase in the hunting activities of the visiting falconers. The western areas of Baluchistan were visited by only one party during 1981-82, whereas at least three parties visited the area during 1982-83. The available reports regarding the hunting success of these foreign hunters are also alarming. Whereas a total of 418 birds were hunted during 1981-82 in Chagai and Kharan districts, some 2510 birds have been hunted during 1982-83, in the same area. It is true that the size of the hunting bag has increased during the last winter due to a comparatively higher population of the bustards wintering in this region, but the higher number of hunting bags of the Houbara

has also been possible due to the gradual acclimatization of the visiting Arab falconers and their increased local knowledge of the area. There is an urgent necessity to evaluate the long term effect of such a large scale hunting stress on the population of the Houbara in the area.

The available hunting bag data of the visiting falconers reveals that there were more females hunted than males (in Chagai 820 males: 922 females, $\chi^2 = 5.972$, significant at 0.02 level; in Kharan 131 males: 177 females, $\chi^2 = 6.870$, significant at 0.01 level; and 138 males: 322 females, $\chi^2 = 73.6$, very significant). This is despite the fact that the female Houbara gives a much tougher fight to the falcon than the males (personal communication from an experienced local hunter of Yakmuch, District Chagai). It is believed that though there are very slender chances of survival of the male bustard from the falcon attack, the female stands certain chances of surviving such an attack. Further, the males are almost 25% larger than the females and hence have more chances of being spotted by a falconer. These facts when seen together suggest that the number of females are more in population than males. If further studies prove this hypothesis to be true the causes for such a population imbalance would be very interesting to study. The alternative hypothesis would be that the population has an equal number of males and females; but certain sexual differences and behavioural adaptations render the males less vulnerable to falcon hunting. This would mean that a larger proportion of the females are being hunted, which would certainly have a very detrimental effect upon the population of the Houbara.

The analysis of the daily bag of the parties hunting in the same area for many consecutive days reveal that hunting for 9 consecutive

days by 104 falcons with the help of 15 vehicles in Harmagai (Kharan) and by 108 falcons with the help of 37 vehicles in Pul-Chotao (Chagai) did not cause of significant decrease in the number of the hunted birds (Regression coefficient = 1.5833, $t_{(7)} = 0.2491$, $P = 0.90 - 0.80$, highly non significant; and, Regression coefficient = 2.1833, $t_{(7)} = 1.9188$, $P = 0.10 - 0.05$, not significant, for Chul-Chotao and Harmagai, respectively). However, hunting for 10 consecutive days by 108 falcons and 37 vehicles in Yakmuch (Chagai) and for 17 consecutive days by 98 falcons with the help of 15 vehicles in Charkohan (Kharan) did cause a decline in the size of the hunting bag (Regression coefficient = -0.326 , $t_{(8)} = 15.3234$, $P = 0.001$, very highly significant; and, Regression coefficient = 0.326 , $t_{(15)} = 4.6317$, $P = 0.001$, highly significant). However, on the last day of the hunt in Yakmuch only 15 Houbara could be captured as compared to some 90 captured on the first day; but when the same party visited the same area after an interval of 16 days, the original high hunting bag was once again maintained indicating that the population during the later hunting period comprised of newly arrived migrant birds. These facts would suggest that the population is either very mobile and is constantly shifting or that there is a continuous replacement of the population in the area by that present in the surrounding areas. The second alternative seems to be more true as the Houbara is said to travel long distances in search of food or unexploited habitat (Surahio 1981). Under such conditions it seems that in the future years the population of the Houbara will be subjected to a greater hunting stress, as the visiting hunters become more familiar with the area and the hunting aids get more sophisticated.

Population Distribution: The Houbara seems to have a wide distribution in Baluchistan and its adjacent areas. The high densities of the bird are thus present in vast, open and desert steppes of Yakmuch, Nushki and surrounding areas of Chagai, the plains of Kharan and Punjgur, the coastal areas of Mekran, Dasht area of Mustung, plains of Sibi and adjoining parts of Sind, and in Taunsa. The population of Taunsa, however, moves to the riverian area during dry season. The Houbara, generally avoids high mountain ranges and narrow valleys even when passing to their wintering or breeding grounds. Thus the Houbara is almost non-existent in the northern hilly tract of Baluchistan such as the Sulaiman Range, the Toba Kakar Range and the northern extremities of the Central Brahui Range, occupying most of the Loralai, Zhob, Pishin and Quetta districts. They are found in very

limited numbers in Khuzdar and Kalat. The extreme desert conditions existing in areas beyond Nok Kundi and Hamun-i-Mashkhel also pose limitations to the dispersal of the Houbara population, though they are present in small numbers in a very dispersed way during certain seasons having better rainfall.

The hunting success of the Arab falconers may prove to be a valuable index of the population density of the Houbara in the area. Because of their very ample monetary resources hunting is concentrated wherever the quarry is most abundant irrespective of the accessibility or logistic problems in reaching remote areas. Their only consideration being to reach the area that has a high population of the bird, which could fetch them greater hunting pleasure. In order to achieve this objective, these falconers have advance survey parties, and employ local guides and hunters, to aid

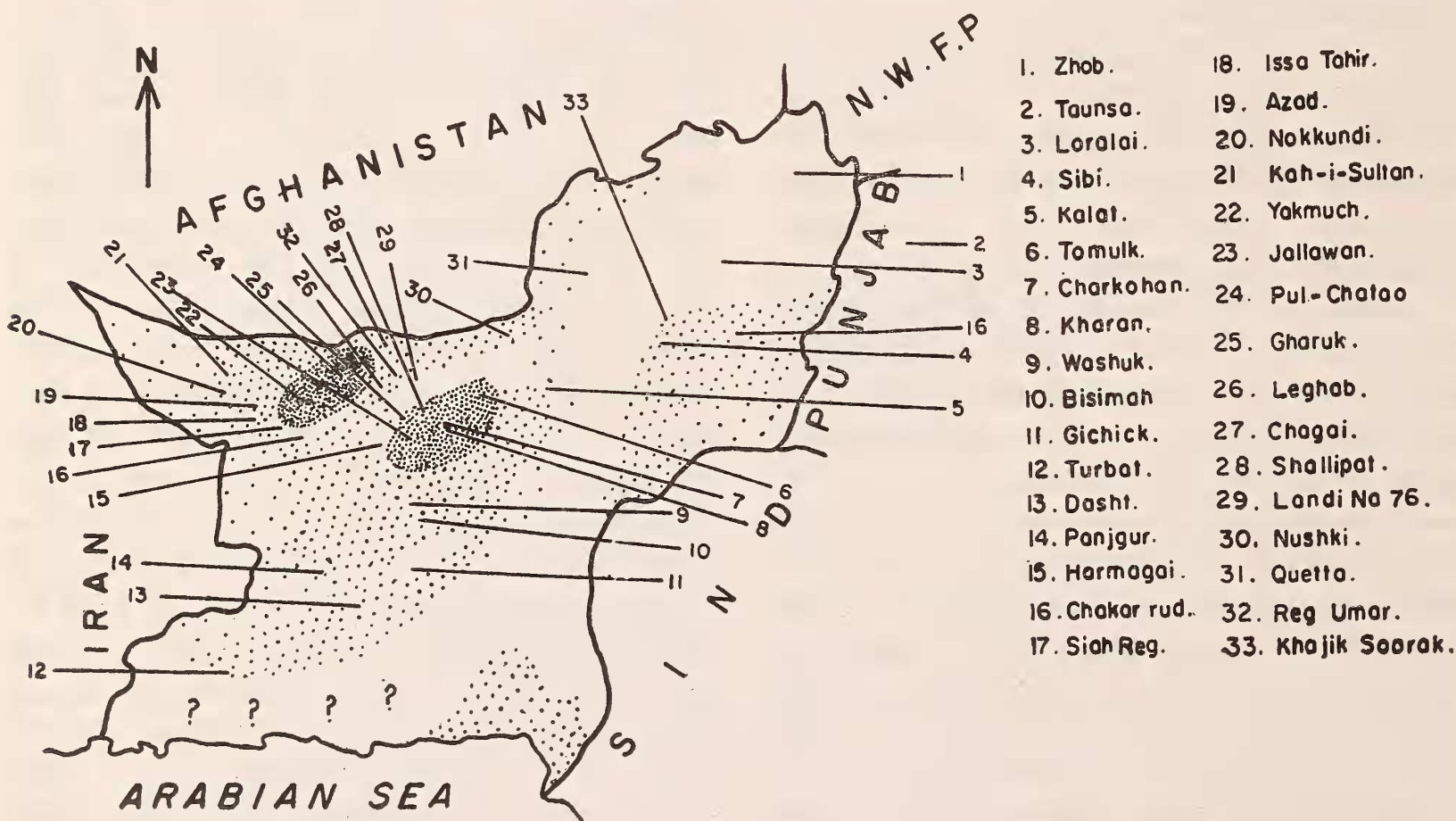


Fig. 1. A line sketch of the Baluchistan showing the tentative distribution of the wintering population of Houbara Bustard.

them in selecting better camping areas. The survey is conducted by these advance survey parties, so as to find the areas of high bustard population density. The recent evidences suggest that higher bustard population existed in Yakmuch and Pul-Chotao areas of Chagai, and Hurmugai and Charkuhan areas of Kharan. High densities of the bird are present in Laghab, Rag Umar, Azad, Issa Tahir, Siah Reg and Landi No. 76 in Chagai District; Shelli Pat, Barkoh, Shamshi, Washuk and Besimah in Kharan, Gikch, Taroom and Dast in Panjgur; Mach Chakar Khan, Safie, Kalay Wala Kirar, Washin in Sibi. Adequate population is present in Dasht area of Mustung, Khuzdar, Kalat and Taunsa. A proper scientific study and survey of the areas is still very urgently needed to evaluate the actual population levels in different areas, however, a tentative map showing the population density according to the hunting successes can be derived from these observations and is presented in Figure 1.

There is a general consensus of opinion that there was a much larger population of the Houbara in all its wintering grounds, in Baluchistan during both 1981-82 and even greater population during 1982-83 winter season. This may be attributed to the fact that the winter rains were high during 1981-82, resulting in a more luxuriant vegetation in the area. Further data are needed to study such annual fluctuation in the population of the visiting bird. These casual observations of the hunters and local people may not be the indicator of the fact that the visiting population was significantly higher than the previous year's, but the local presence of rich vegetation cover in those areas which received the excessive rainfall might have prevented the normal dispersion of the population of the bird. However, such conditions definitely aid the activities of the

hunters, leading them to jump to the erroneous conclusion regarding the population level. If this alternate hypothesis is true then the better rainfall and vegetation may have a deleterious effects upon the population rather than bolstering it up. In fact the winter rains in the area show a cyclic variation of 4-5 years (Roberts 1973). Future data regarding such population fluctuations and hunting successes would be interesting.

Breeding: It has been frequently speculated that the vast desolate areas of Baluchistan may harbour some breeding activities of the Houbara (Ali and Ripley 1969, Siddique 1972, Anonymous 1972), however, concrete evidence is lacking. Anonymous (1972) did report collecting some Houbara eggs from Muslakh Forest Reserve (District Pishin) and these eggs were hatched in the Government Poultry Farm, Quetta; but the chicks did not survive. During our previous survey of potential breeding areas in Chagai and Kharan in April, 1982, local hunters and Forest Guards did report about the occurrence of the breeding activity of the bird in the area and promised to show some nests with eggs. However, because we failed to find any direct evidence about the presence of eggs, young chicks or even adult birds in that season, we considered the probability of any Houbara breeding in that area to be very slight (Mian & Surahio 1983). However, we continued our efforts to collect further data regarding this important aspect of the biology of Houbara Bustard. It was brought to our notice that Sheikh Mohammad Bin Rashid Al-Maktoum of Dubai had hatched a Houbara chick from a clutch of three eggs most probably collected in Baluchistan (W. A. Kermani 1982).

The information collected by us so far indicates that there has never been any signs of the breeding activity in the eastern flank of

Baluchistan, i.e., Sibi and Dera Ghazi Khan, and that eggs or young chicks have never been reported from that region till now. However, reports regarding Chagai, Yakmuch, Kharan and Punjgur seem to indicate that occasional breeding in these areas does occur. The description of the eggs, and the nest described by various sources from these areas agree perfectly with those reported in the literature (Collar 1979). Though the exact data regarding the number of the breeding pairs present in the area is not available, it is believed that some 50-100 pairs lay eggs in Yakmuch, Kharan and the valley of Chagai Hills. There are reports of some very limited breeding activity of the bird in the vicinity of Punjgur. Further research is needed to confirm how far these reports are reliable, but it is suspected that this breeding activity is not a regular but only sporadic feature of the area by straggling birds. Furthermore, these birds are reported to fly off to their normal summering grounds, when the chicks are still

very young. If such is the case further research would still be needed to ascertain the factors which induce occasional pairs to lay eggs in the area and then continue with their northward migration leaving the very young chicks behind.

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HOUBARA IN BALUCHISTAN

APPENDIX I

Facsimile of the questionnaire regarding biology and breeding research on the Houbara Bustard in Baluchistan.

N.B. Please collect the information by your own observations and through contact with the reputed local hunters of the area.

1. At what approximate time the first incoming bird was seen in the area.
2. What hour of the day is preferred for migration.
3. What are the approximate number of the birds in an incoming group.
4. From which direction these birds enter the area.
5. What is the approximate period of stay of the bird in the area.
6. What is the preferred habitat of the bird in the area.
7. Describe the topography and general vegetation of the area.
8. What is the preferred food and how abundant is it in the area.
9. What are the areas having high/medium/low densities of the bird.
10. What is the approximate number of the birds in the area.
11. What is the general mode of hunting of the local and foreign hunters in the area.
12. What is the customary practice of live trapping of Houbara in the area.
13. Give a reasonable estimate regarding the number of the birds hunted by local hunters in the area. Please indicate sex and age, if possible.
14. What is your information regarding the number of the foreign hunting parties, number of hunters in each party, number of falcons and vehicle. Can you give the number of the birds hunted by the said party with dates and sex of the hunted bird.
15. Have you seen any eggs/young chicks/brooding birds in the area. If yes, what was the shape, size and number of the eggs per nest.
16. What are the approximate breeding pairs present in the area.
17. Have you seen the bird during summer, i.e., April to September.
18. What is the approximate season of the egg laying.
19. What is the approximate time, when the birds leave the area.
20. What is the number of birds in a group leaving the area.
21. Any other information.

If possible please collect the stomach of the hunted birds, preserve it in formalin/alcohol, bag these separately in plastic (cellophane) bag with a wing primary feather and tarsus. Please record the time and date of the capture of the bird.